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(56) Documents cited

GB 2199658 A

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(58) Field of search

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(54) Method of accessing race competitors using an Infra-red detection system

(57) A method of measuring the infra-red radiation emitted by an organism, in which an infra-red sensor (1) takes measurements during at least three sampling periods, which are then statically processed, the results are stored in memory (6) and can be selected to be shown on a display (5). The results can be used to access the condition of race competitors.

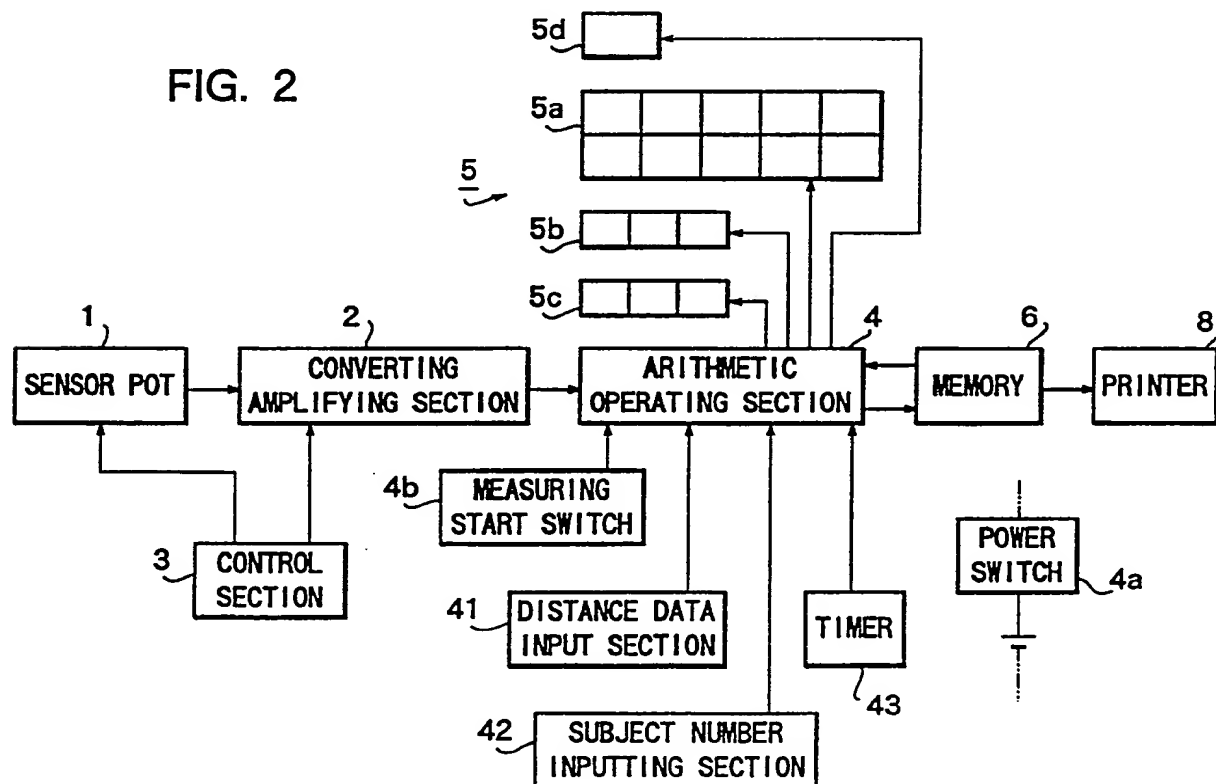
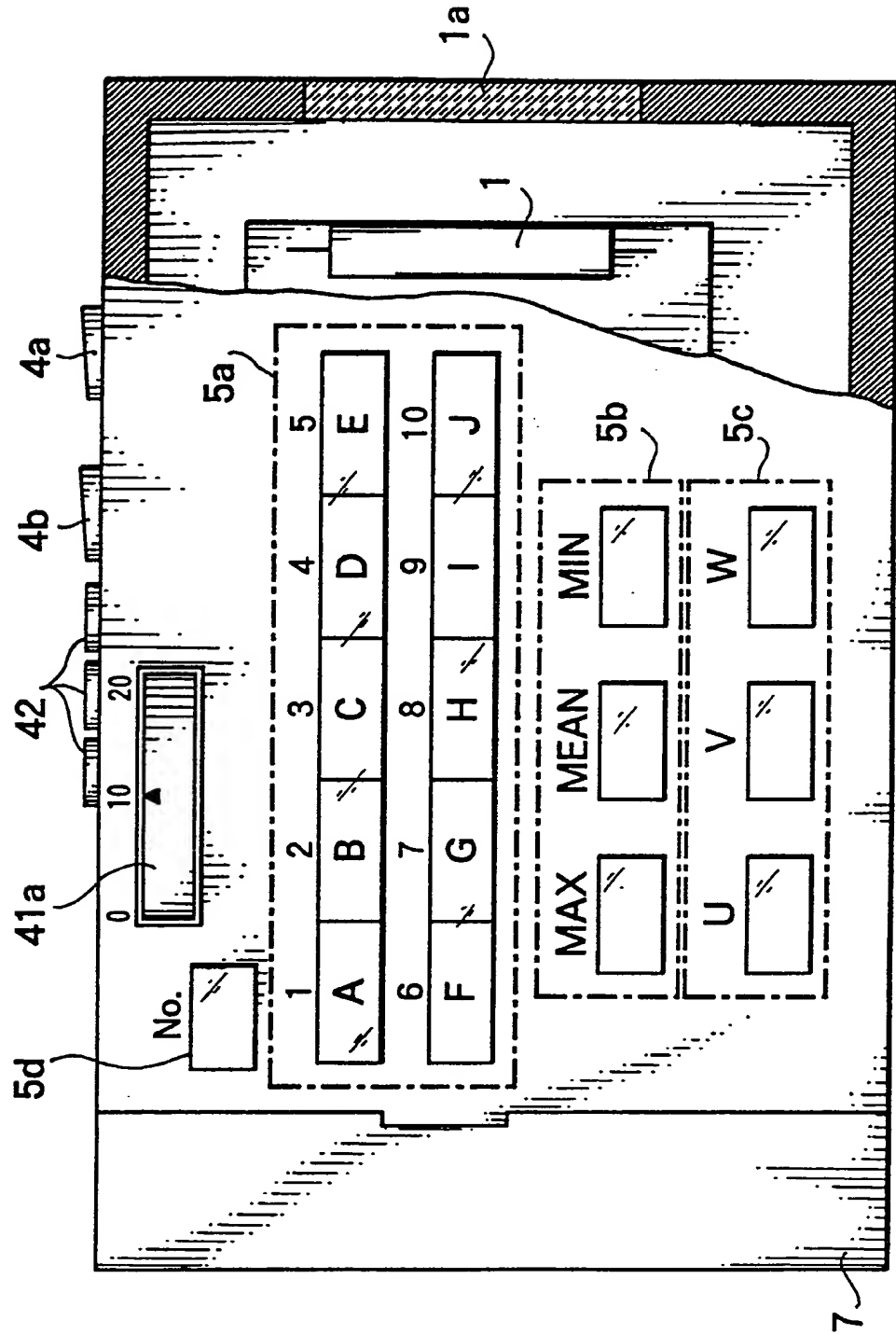


FIG. 1



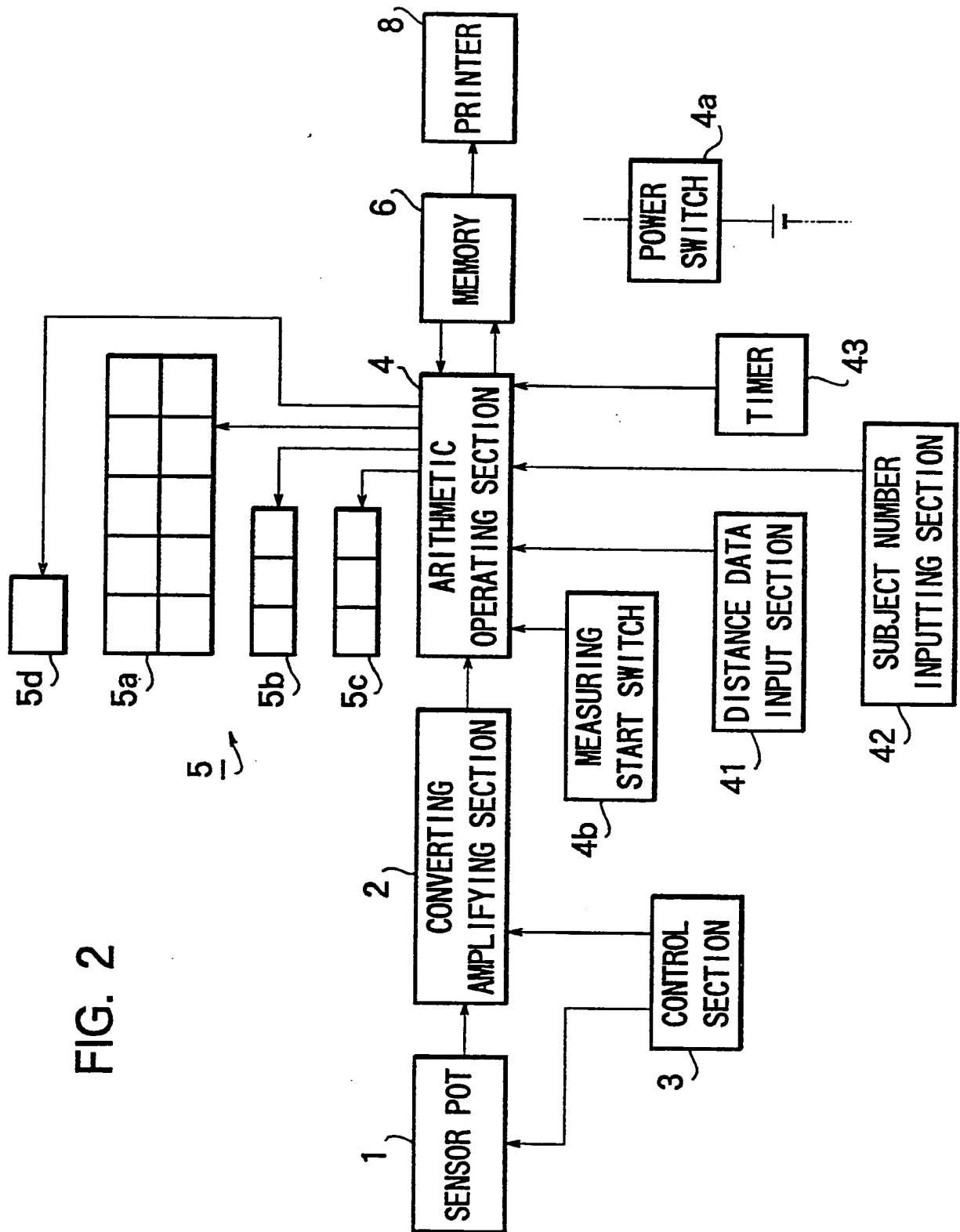


FIG. 2

"A METHOD FOR MEASURING AN ORGANISM SUCH AS A HORSE"

5 The present invention relates to a method for measuring an organism to obtain data for estimating a condition of the organism by detecting far infrared rays radiated by organisms such as a race horse and the like.

10 Estimation of whether a race horse gallops well in a race has been performed on the basis of information about the pedigree, race experience and the results of the last race, or the increase or decrease in the body weight of the horse. However, since the ability of a horse to gallop well is dependent on the condition of the horse as well as on past results and
15 the pedigree of the horse, even a horse having real power does not always gallop well. The condition of a horse has been estimated by observing by eye the horse taken with a person in a paddock. The estimation of the condition of a horse by observing
20 the colour of the fur or the gloss of the fur by eye does not involve objective data because of the subjectivity of the observing person; therefore this data cannot be substantially quantified or averaged so as to be utilised by a large number of people at the
25 same time.

30 The present inventor has found that organisms such as horses or the like radiate far infrared rays depending on their condition. The present invention seeks to provide a method for measuring such organisms to estimate their condition.

35 According to the invention there is provided a method for measuring organisms such as a horse and the like, said method comprising measuring far infrared rays radiated by the organism by using a far infrared rays-measuring means constituted by a far infrared ray sensor at least three times over a random sampling

period; and outputting in an appropriate display means the numeral values obtained from an arithmetic operation of predetermined measurements such as the minimal value and the maximal value, or said measurements together.

Thus the condition of a race horse before a race is determined by the results obtained from an operation of the measurements in which a dose of far infrared rays radiated from each racing horse are measured. Therefore, the condition of racing horses which has been observed by eye can be represented by objective numeral data, so the present method is convenient practically.

In order that the invention may be better understood, an embodiment thereof will now be described by way of example only and with reference to the accompanying drawings in which:-

Figure 1 is a partly diagrammatic sectional side elevation of an embodiment of the measuring unit for working the present invention; and

Figure 2 is a block diagram shown in Figure 1.

The reference numeral 1 in Figure 1 denotes a far infrared ray sensor pot, which, e.g. is constituted by a thermal detector. The detectors may be those which utilise quantum effects and a resonance detector. Reference numeral 1a is a mask filter, in which, if necessary, a quite freely opening and shutting shutter (not shown) may be provided.

Thus the above-mentioned sensor pot 1 with a thermal detector convert the incident far infrared rays from a horse body to heat, which operates a generating means to generate a signal proportional to the received amount of thermal energy.

The reference numeral 2 in Figure 2 denotes a converting-amplifying section which converts and amplifies the signal outputted from the above-

mentioned sensor pot 1 to a suitable electrical signal. In the section 2, far infrared rays generated in the above-mentioned sensor pot 1 are converted to a digital signal and amplified.

5 Reference numeral 3 denotes a control section which controls the operation timing as between the above-mentioned sensor pot 1 and the converting-amplifying section 2, and then a signal from the converting-amplifying section 2 is supplied to a next
10 arithmetic operating section 4.

 In the arithmetic operating section 4, each measurement from the converting-amplifying section in each operation is once stored in a memory 6 as it is, and then the measurement is read out to be corrected
15 by a correcting element such as a measurement distance or the like. The corrected value is supplied to a display section 5 to display each measurement, and then the corrected values are combined to treat on the basis of the predetermined plural arithmetic
20 equations, the value from the treatment being supplied to the display section 5 to display the arithmetic operating value. The value after correction and the measurements from the arithmetic operation are also stored in the memory 6.

25 The above-mentioned arithmetic operating section 4 is accompanied by a distance data input section 41 which corrects the variations of the measurements ascribed to change in the distance between the sensor pot and an organism such as a horse
30 as a subject, a subject number inputting section 42 which inputs the numbers of the subjects, and a time 43 which selects and changes the operation timing against the above-mentioned control section 3.

 Reference numerals 5a-5c denote display
35 sections in Figure 1, comprising ten display media with LED or the like to display plural measuring time,

e.g. ten measurements, and seven display media to display the measurements obtained from the arithmetic operation.

Reference numeral 5a denotes a display section
5 for the subject number, i.e. the proper number
assigned to a horse as a subject, 41a is an input dial
in the distance data inputting section 41, 4a is a
power switch, 4b is a measuring start switch, and 7 is
a power supply, these sections constituting a
10 measuring unit.

Furthermore, an embodiment of the above-
mentioned unit is illustrated in the following.

When a race horse is taken by a person into a
paddock in a race track, the power switch 4a is
15 switched on, the distance between the measuring person
and the measured point (location) is measured by eye,
and the distance input dial 41a is adjusted to the
value of the distance measured by eye.

If the sensor pot 1 in the measuring unit is
20 turned toward the horse to be measured and the
measuring start switch 4b is actuated, far infrared
rays radiated from the horse are measured over a
suitable sampling time period, e.g. a 200 msec unit
ten times successively.

25 Measurement is performed in the above-
mentioned predetermined time period, and then 10
measurements after sampling are displayed in the
above-mentioned 10 display media with or without
correction.

30 For example, each of the 10 measurements are
subjected to arithmetic operation in the arithmetic
operating section 4 as follows.

First, the maximal value (Max), the minimal
value (Min) and the mean value (Mean) are displayed at
35 the display 5b in the display section 5, respectively.

Then, the difference (absolute value) between

the sum of the first measurement A and fourth measurement D and the sum of the fifth measurement H - and the eighth measurement H is operated in the arithmetic operating section 4, and the obtained value U is displayed in the display 5c in the display section 5.

The difference between Max and Min is obtained from the operation, and then the difference W between Mean and V is also obtained from operation, values V and W are each displayed in the display 5c in the display section 5.

Each value U, V and W obtained from the operation in the arithmetic operating section is stored in the memory 6. The display means may be another visual display means such as an analog meter display or an on and off display of the LED line besides the digital display. Furthermore, the measuring order and number of each horse is displayed in the display section 5d, which is stored in the memory 6 together with the measurements in each time already stored in the memory 6.

Thus for example, the plural race horses which pass the measuring point in the paddock successively are measured for the amount of far infrared rays radiated from them.

Although each measurement measured in each race horse is displayed in each display section 5a-5c for each measurement A-J and the predetermined arithmetic operation value U, V and W of each horse in every measuring, when each measurement and arithmetic operation value of each horse stored in the memory is to be displayed lately, an operation switch in the memory 6 may be actuated to display the value in the display section 5a-5d. Each measurement may also be printed out, if a printer 8 is provided in the unit.

The thus-obtained measurements and arithmetic

operation values on each horse are evaluated on the basis of much experience, as follows:

Good evaluation is that the value $|U|$ obtained from the above-mentioned arithmetic equation, $(A + D) - (E + H) = |U|$, is less; the value V obtained from the equation, $\text{Max} - \text{Min} = V$, is also less; and the value W obtained from the equation, $\text{Mean} - V = W$, at a sampling period of 200 msec in a total of 10 times of measuring one horse. These results are based on the experience that a horse whose value of far infrared rays obtained from plural measurements over an appropriate sampling period is not varied and is stable has exhibited a good galloping performance.

When a betting ticket to a race horse was bought according to the above-mentioned evaluation standard, the probability involved in a repayment prize (Rensho Hukushiki) was 80% or more.

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CLAIMS

1. A method for measuring organisms such as a horse and the like, said method comprising measuring
5 far infrared rays radiated by the organism by using a far infrared rays-measuring means constituted by a far infrared ray sensor at least three times over a random sampling period; and outputting in an appropriate display means the numeral values obtained from an
10 arithmetic operation of predetermined measurements such as the minimal value and the maximal value, or said measurements together.

2. A method according to claim 1, wherein the values obtained from arithmetic operation of the
15 measurements displayed in a display means with an appropriate combination are comparative values among a difference between the sum of measurements in different measuring periods and the sum of measurements in other measuring periods, a difference
20 between the maximal value and the minimal value obtained from the organism, and the difference between the mean value and said maximal value or minimal value.

3. A method as claimed in claim 1 substantially
25 as hereinbefore described with reference to the accompanying drawings.

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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

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Relevant technical fields

(i) UK CI (Edition K) G1A (AHC, AAM)

(ii) Int CI (Edition 5) A61B (6/00)

Search Examiner

J A WATT

Databases (see over)

(i) UK Patent Office

(ii)
 ONLINE DATABASE: WPI

Date of Search

5 MARCH 1992

Documents considered relevant following a search in respect of claims

1 TO 3

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
Y	GB 2199658 A (MATSUSHITA) figure 1. Page 51 lines 18 to 26	1
Y	GB 2057682 A (NILSSON) page 1 lines 8 to 11	1
Y	FR 2613210 A1 (MARCHAND) page 1 lines 1 to 6	1

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).